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# If it fell on HAMPSTEAD

## Introduction

If an atom bomb fell on Hampstead, what exactly would happen? How many people would be killed? What would happen to the buildings? What would be the after effects? What could be done by way of protection or rescue?

Most of us have read accounts of the explosion of the atom bomb at Hiroshima, but we cannot quite imagine what would happen in our home district. Here in this pamphlet are some of the answers. No attempt has been made at lurid descriptions. They have been worked out soberly and seriously by scientists, all members of the Hampstead Branch of the Association of Scientific Workers, at the request of the Hampstead Peace Council, to tell us as accurately as possible what would happen if an atom bomb fell in the centre of Hampstead, right in the middle of Fitzjohn's Avenue.

The Government recently published a Home Office Civil Defence pamphlet "Atomic Warfare," based on the knowledge gained from the atom bomb explosions in Japan in 1945. Throughout our pamphlet these official figures and predictions have been used, except where specifically stated.

It should be made clear at the outset, however, that though the facts and figures given here are all based on the Hiroshima bomb, there may be other factors in the future which would alter them. The first is that we know atomic bombs already exist with a much greater explosive power than that dropped at Hiroshima. A second is that it is highly probable that more than one bomb would be dropped at a time, and this would not just double the dislocation or chaos, it would multiply it several times. Then large amounts of dangerous bacterial poisons and viruses, as well as radioactive substances which would contaminate the ground, would quite possibly be dropped from the air, and in such disorganised conditions would be even more effective. There is still, moreover, the whole problem of the hydrogen bomb, on which research is being carried out at the present moment, and which may well change the whole picture.

Here, however, we are simply dealing with a bomb of the Hiroshima type, as the only one which has actually been dropped, about which facts and figures are known.

## How is the bomb different from other bombs ?

First of all, what is the difference between an atom bomb and other bombs? Well, if you take the atom bomb dropped at Hiroshima on August 6th, 1945, you might say its effect was roughly the same as 20,000 tons of high explosive dropped together, or, to put it in a way we can all imagine, 10,000 land mines all on our borough.

But this gives us very little idea of the real difference in the explosion. The strength of the high explosive bomb lies mainly in one effect—blast, but the atom bomb works through three different effects—ininitely greater blast, and in addition heat and radio-activity.

Take the heat first. At the centre of the explosion a wave of intense heat is given out, as intense as the centre of the sun ; and within half a mile, that is, from halfway down Canfield Gardens to about Hampstead Tube Station, practically everything combustible would burst into flames in a split second.

The effects of this quick and intense wave of heat, however, are felt far beyond the half-mile radius. At Hiroshima, the heat flash simultaneously scorched and set on fire clothes and houses two miles from the centre of the explosion. Thousands there “were pinned beneath wreckage and were soon consumed by the holocaust of fire that swept the city and made rescue impossible.”(reference 1 at end).

Apart from these fires springing up as isolated points, people in the neighbouring areas, if in the open air, would be struck by the same heat flash instantaneously, as if by lightning, with resulting burns which would destroy both the skin and the underlying flesh—and this would happen up to a mile away, with lesser burns up to two and a half miles off. So that anyone in the open in Hampstead from Kilburn High Road to Hampstead Heath might receive severe and possibly fatal burns, and the chance of lesser burns would reach from beyond Harrow Road to Highgate.

## Radiation Sickness

The second effect of the atom bomb is gamma radiation . This gives a type of injury that belongs to the atom bomb alone. We never knew it with any of the explosives used in the last war. The bomb gives off a radiation known as “ gamma rays,” which are very harmful to living things ; they travel with the speed of light, “ passing through considerable thicknesses of building, and easily penetrating the human body.” Small particles known as neutrons are also produced at the moment of the explosion. In addition, the fission products left behind after the explosion are intensely radio-active, and form the mushroom-shaped cloud we have all seen in photographs of atomic explosions.



The first of these effects, the gamma radiation, in its single instant of existence can, like a single bullet, kill and injure people directly ; neutrons, the second new feature may induce harmful radio-activity in materials they strike ; the fission products, if they come down to earth in any concentrated form, will produce similar effects to the gamma rays, This is most likely if the atom bomb explodes at ground level.

The symptoms of the radiation sickness set up by all three include nausea, vomiting, bloody diarrhoea, intense thirst, fever, etc, and in the case of pregnant women, probable miscarriage. What is happening is that the bone marrow, which produces the vital red and white cells in the blood, is affected. In serious cases the patient dies, in a few hours, or in a few weeks, from the lack of protection against infection provided by the white cells on the one hand, and from anaemia or lack of blood on the other.

## **Blast**

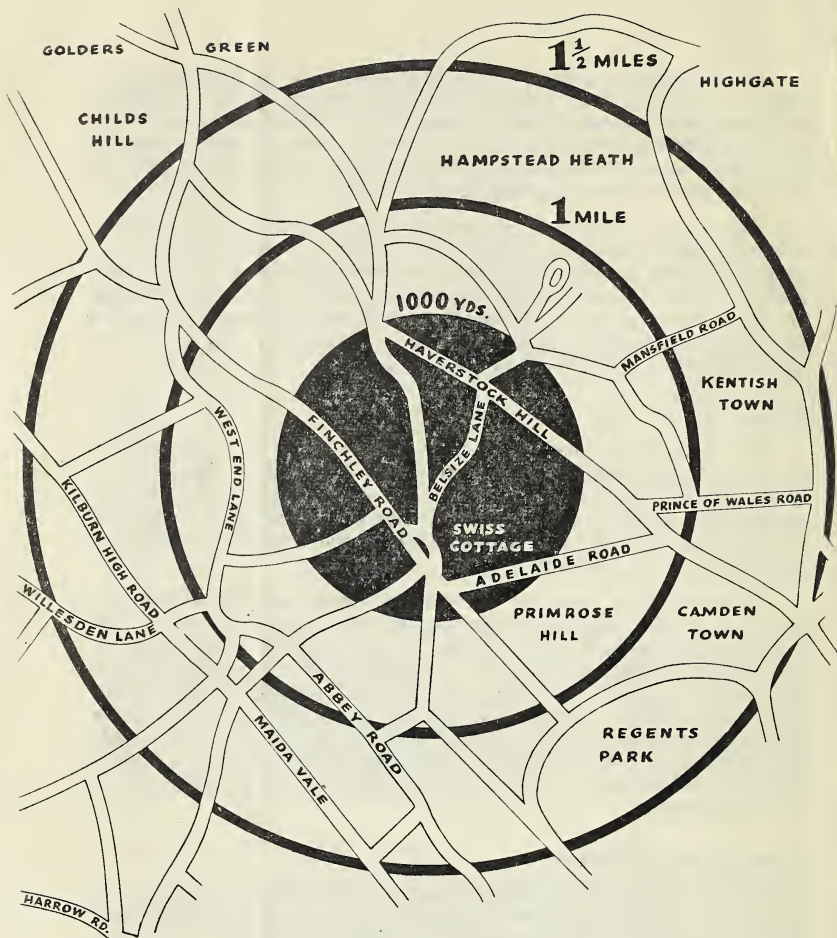
The third effect—blast—is the same we have known from high explosive bombs, only infinitely more powerful. The Home Office pamphlet estimates that the number of houses demolished or requiring demolition within a mile radius would be about 30,000. Owing to the amount of open space in Hampstead, there are only approximately 19,000 houses here and nearly all these would be destroyed.

Look at Map A (page 6). In the Home Office pamphlet, on page 40, there is a diagram showing the effects of blast to be expected from any one bomb—not that there is any guarantee that the number of bombs would be limited to one. Map A has been made by imposing this Government diagram on a simplified map of Hampstead. A study of it shows that all houses would be destroyed within a radius of 1000 yards, that is from the White Stone Pond on Hampstead Heath to halfway along Fairfax Road. It is probable that all the houses between Mansfield Road and Willesden Lane in the one direction, and between Childs Hill and Regents' Park in the other, would need major repairs.

## **Deaths and Injuries**

Now what does all this mean in terms of the deaths and injuries to be expected in Hampstead? Look at Map B (page 5). It has been built up in the same way as Map A, by imposing two diagrams from the Home Office pamphlet, on pages 9 and 19, on a map of Hampstead.

There are 90,000 people living in the 2265 acres of Hampstead, an average of about 40 to an acre. It is calculated that within a half-mile radius of the centre of the explosion at least 20,000 people would be killed. Between the edge of that half-mile circle and a wider circle of a further quarter of a mile radius—the last quarter of a mile of Haverstock Hill, for instance—in which a further 25,000 people live, at least 10,000 would be killed by radiation alone, leaving out ordinary fires and the effects of blast. This gives a total of 30,000 deaths from heat and radiation alone within the first three-quarters of a mile radius of the explosion.

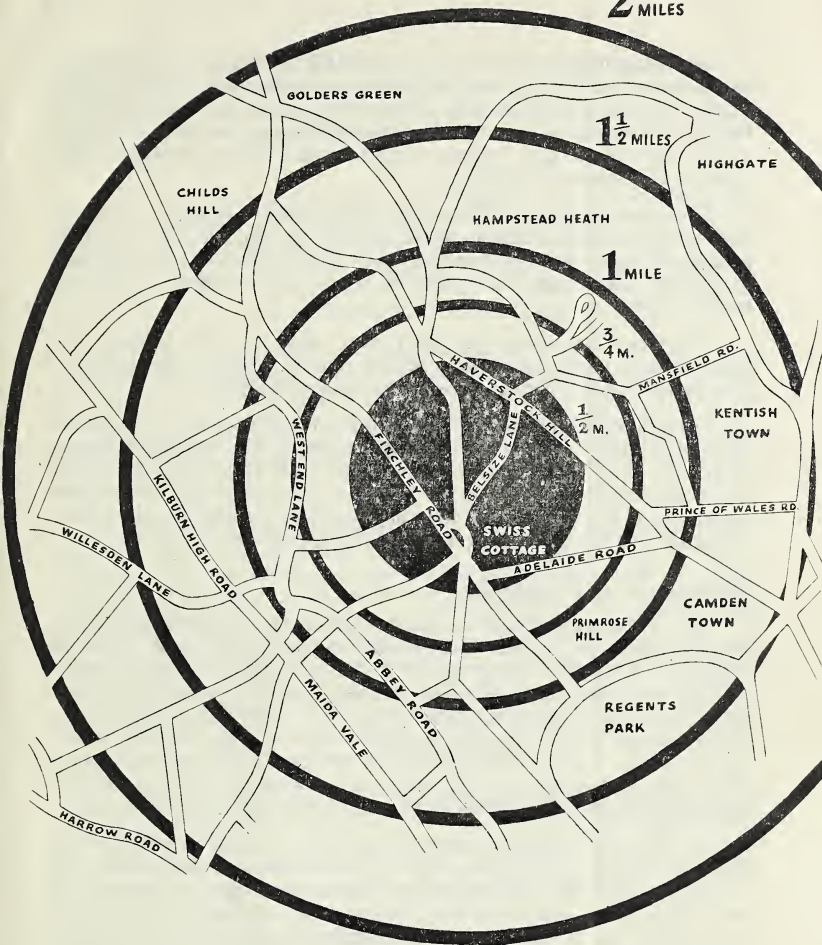


Key to Map "A" above.

## DAMAGE TO HOUSES

Distance from Explosion Centre	Damage
Up to 1000 yards	All houses completely destroyed
1000 yards to 1 mile	All houses damaged beyond repair and requiring demolition
1 mile to 1 1/2 miles	All houses requiring major repairs; temporarily uninhabitable.
Over this range	Houses temporarily uninhabitable, requiring minor repairs.

2 MILES



Key to Mrp "B" above

## DEATHS AND INJURIES

Distance from Explosion Centre	Deaths and Injuries
Up to 1/2 mile	All inhabitants killed by blast, radiation or burns.
1/2 to 3/4 mile	Half the population killed by radiation, an unknown by blast and/or severe third degree burns.
3/4 to 1 mile	Severe third degree burns on all exposed skin. Unknown number killed by blast effects and radiation.
1 to 1 1/2 miles	Flash burns on exposed skin; lesser radiation effects including loss of hair.
1 1/2 to 2 miles	Milder burns on exposed skin.

NOTE:- Blast injuries due to falling houses, glass, etc. at any radius cannot be estimated.

According to the reckoning of the Home Office Manual (p. 13) however, only half the deaths in the area will be due to these causes ; the other half will die as a result of blast, fires, falling debris and so on. This means in Hampstead another 30,000. So the Home Office estimate of an average of 50,000 deaths to one atom bomb in a district with a similar population seems to be the least that can be expected.

That is only the dead. What about the injured ? The map, with figures from the Home Office Manual, shows that injuries from all these causes can be expected up to two miles from the centre of the explosion—from Highgate to Harrow Road—and the number of people affected would be at least another 30,000.

It comes to this—practically every man, woman and child in Hampstead stands a high chance of being killed or injured. (90,000 inhabitants of Hampstead ; 50,000 to 60,000 dead, 30,000 probably injured.)

It must be remembered once again that all these figures and deductions are worked out on the basis of the Hiroshima bomb, in the conditions existing there at the time, with no warning, few shelters, and a completely inadequate rescue and medical service. So the next question is obviously whether these deaths and injuries can be reduced by any system of warning, air-raid shelters, rescue services and medical treatment, and if so, how ?

## Warnings and shelters

It is commonsense that no shelters are any good unless they can be reached in time. Jet bombers can fly at 600 m.p.h. for long distances, so that the period of warning will be much less than during the last war. There is also the possibility that rockets and remote-controlled missiles will be used to carry atom bombs, in which case, as with V.2's of the last war, there would be no warning at all. If high speed-bombers are used, and not rockets, fifteen minutes warning might be the best that can be reckoned on. So that the people must be able to reach shelters in a quarter of an hour at the most, and therefore shelters distributed in the same way as last time must be built.

On the other hand, they must be constructed in quite a different way. They must not only be able to stand up to the enormous blast produced by an atomic explosion, but should also be able to give sufficient screening from the high-intensity gamma-rays responsible for the radiation effects. Only such a shelter as the tube station at Hampstead, or the deep tube shaft next to Belsize Park Station would give certain protection from an atomic explosion immediately overhead, and it is obviously quite impossible, even if these shelters were available, for the whole population of Hampstead to get to them in time. If the bomb were exploded at ground level, moreover, the earthquake wave it would produce might wreck any shelter less than five hundred feet underground.

Assuming, however, that the bomb is exploded in the air, as at Hiroshima and Nagasaki, it is true that outside the half-mile radius of total destruction,



the number of casualties would certainly be reduced if the population were in a system of sub-surface shelters not less than ten feet deep with at least two feet of solid concrete, or three feet of well-packed soil, overhead. Though if these shelters have to resist the weight of buildings falling on top of them, they would have to be even stronger.

A further difficulty is that even if such shelters could be built, they would all have to communicate with each other to be of any use. As pointed out earlier, the bomb gives out radio-active substances which are liable to hang about and "infect" the earth and other objects, and if any region is contaminated, people in shelters underneath it would be unable to leave them unless there were underground communication with other shelters.

At a still further distance from the centre of the explosion, some protection against gamma rays would be given by deep slit trenches. Clothing brown paper, etc. give some protection from the heat flash yet the American expert LeRoy says that at Hiroshima "people received flash burns serious enough to warrant treatment at distances as far from the centre of the explosion as two and a half miles" (ref. 2 at end) it would be as well not to exaggerate it.

What it amounts to is this—provided that sufficient warning is given and only on that condition, the provision of a fairly elaborate system of subsurface and deep shelters, all communicating with each other, would give the people of Hampstead some degree of useful protection. It goes without saying that the cost of this would be pretty high, and although theoretically it might be possible to provide such shelters for Hampstead alone, the authorities must reckon that the bomb—even if it were only one—might fall anywhere, and the same system of shelters would have to be built for every Borough in London and for every big town in the British Isles, in order to be adequate. Whether, in the present economic state of the country, any Government could stand the expense of it is doubtful.

A further consideration is that the immense destruction and loss of life we have described could be done by one bomb, carried by one aircraft alone. Therefore the shelters must be occupied, and the medical and rescue services put on the alert, for every hostile plane that approaches ; enemy tactics could thus be easily arranged to keep people almost permanently in the shelters.

## **Medical and Rescue Services**

When we come to the question of rescue services and medical treatment the whole thing comes largely a matter of the people and equipment available. The British Atomic Scientists Association have worked out that 200,000 people would be needed to deal with the effects of one atomic bomb on a typical British city—or more than twice the population of Hampstead.

Several bombs dropped on London would mean that the whole of the adult population of the city would need to have had some general training, and many thousands of them specialist training, in order to cope with the damage and casualties.

Some idea of the enormous problem is given by the American scientists, Pearse and Payne (ref. 3) who estimate that in a crowded city 170,000 doctors, nurses and technicians and 8,000 tons of medical supplies costing about three million pounds would be needed to deal with the burns alone. Thousands of gallons of blood would be needed for transfusions to the patients suffering from the lesser radiation injuries, which means bleeding tens of thousands of blood donors to get it. And further, an atom bomb in Fitzjohn's Avenue would effectively destroy the hospitals at New End, Lawn Road and Haverstock Hill, while most of the doctors and nurses living and working in Hampstead would be killed or injured.

For a great number of the injured there would be no medical help at all. It would be of no use. An American blood specialist has explained why. "It has been shown," he writes " . . . that many casualties following an atom bomb explosion will have received an absolutely fatal dose of gamma rays. For these casualties medical care is a waste of time, material and personal . . . At the present time the only practical way that one can hope to separate the fatally irradiated from those with a chance of surviving is by the prompt development of an easily-read casualty dosimeter that can be worn by all citizens." (ref. 4)

It seems rather doubtful whether ordinary people can be persuaded to carry an instrument round with them which may mean that they will have abandoned to their fate. A more decisive method is suggested by Park (ref. 5); he suggests that the rescue services should separate all the casualties from beyond the two mile radius from the explosion centre, and who are not affected by radiation sickness, from those within, who are. As far as those within are concerned, he says, it would be a waste of the available services to give treatment to people beyond medical aid. Only those who pass a white cell blood test would be given medical treatment.

## **Is this the worst ?**

So this is what scientists have good reason to predict would happen in Hampstead, from what they know about the bomb that was dropped at Hiroshima and the circumstances there. With bigger and more powerful bombs, with the addition of toxins and sprays of radio-active substances from the air, with the hydrogen bomb, none can as yet accurately predict the results ; only they will be worse.

## **Conclusion**

In preparing this pamphlet we have tried to show what the result of an atomic bomb might be for Hampstead people, and have therefore related it to

streets and places known to all of them ; but the same thing might happen anywhere to any London Borough, to any British town, to any city in the world. The victims would be the common people of the world.

We have, too, only considered the atom bomb, and many people will say " Do you only want to abolish the atom bomb, then ? What about other bombs, and other weapons ? " It is precisely because the atom bomb is the worst of all weapons that we wish to abolish it—*first*. The banning of the bomb will make it easier to proceed to the abandonment of other weapons ; no other form of disarmament, whether by reduction of armed forces or by agreements not to use particular weapons, can have any meaning till the most deadly of all is given up. But lovers of peace will not stop there ; all weapons are our enemies.

How can this first and greatest step be taken ? Those responsible for dropping the atom bomb, those who permit it to happen without protest, must be regarded as criminals against humanity. But the people who are willing to use this weapon exert an influence which is out of all proportion to their numbers. They are few. The people who detest this weapon, who want it given up and its shadow of fear withdrawn from all mankind—they are many.

The appeal for the abolition of the atom bomb has already been signed by over 300,000,000 people throughout the world, and this number is growing. The Hampstead Peace Council has already received the signatures of over 20,000 people, and a similar movement is spreading up and down the country.

War is not inevitable. The use of the atom bomb is not inevitable. The united efforts of the peace loving people can, and will, defeat its menace.

There are no disputes between nations that cannot be settled by peaceful means.

## References

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- (3) H. E. Pearse and J. T. Payne, New England Journal of Medicine, 1949, Vol. 241, page 647.
- (4) E. P. Cronkite, "Atomic Medicine "; edited by C. T. Behrens, Director of Atomic Defence Division, U.S. Navy. (New York).
- (5) W. E. Park, Canadian Medical Association Journal, 1949, Vol. 6 page 473.

# **HAMPSTEAD PEACE COUNCIL**

Our aims are:-

To provide means by which organisations and individuals of all faiths and political views, who believe in the possibility of peaceful settlement of every issue between nations, may come together to work in a positive way for peace.

To campaign for this object through meetings, petitions and all forms of publicity, and to obtain the active support of the people of Hampstead.

S.R.Marcus, Secretary, 207 Sumatra Road, N.W.6.